N U T R I T I O N

FACT SHEET

■ INFANT FEEDING: LOW-BIRTH-WEIGHT AND PRETERM INFANTS

The low-birthweight (LBW) and preterm infant cannot be accurately cared for if assessed and treated according to the guidelines for normal infants. Developmental signs and growth are the primary tools used in making recommendations and assessing the infant's status. It can take up to two or three years for an LBW infant to catch up to his peers. Very-low-birthweight (VLBW) infants may never catch up, although they usually develop their own growth curve that parallels that of an infant born at normal weight. A parallel growth curve is acceptable.

DEFINITIONS

Low birthweight (LBW) - infant born weighing less than or equal to 5lb.8oz. (2500g).

Very low birthweight (VLBW) - infant born weighing less than 3lb.5oz. (1500g).

Preterm - infant born before 37 weeks gestation, regardless of birthweight.

Thermoregulation - maintaining heat (body temperature).

Failure to Thrive (FTT) - a state of inadequate growth resulting from an inability to obtain and/or use calories required for growth.

Necrotizing enterocolitis (NEC) - an acute inflammatory disease of the bowel causing abdominal distention, gastric retention and bloody stools. Most common among VLBW infants due to an immature bowel.

Bronchopulmonary Dysplasia (BPD) - a chronic lung disease usually caused by long-term oxygen administration and mechanical ventilation along with lung immaturity. Often accompanied by accumulation of fluid on the lungs.

Swaddling - Wrapping a receiving blanket snugly around the infant so his arms are held close to his body and cannot move about.

Kangaroo care - Skin-to-skin contact. Dressed only in a diaper, baby is held next to his mother's or father's chest. Research shows that babies mature faster and there is increased bonding. Babies who receive kangaroo care often sleep and breathe better.

How To Correct for Gestational Age

Correct for gestational age only if the infant was born less < 36 weeks gestation.

Corrected Age = Chronological age in weeks minus the number of weeks premature

For example: An infant was born on 8/2/93. The estimated date of delivery was 8/30/93. What would be the corrected age for this infant on 9/20/93?

Chronological age	7 weeks
# weeks premature	- 4 weeks
Corrected age	**3 weeks**

Plot on growth chart using corrected age to at least one year of age or until the child's growth is normal based on his/her chronological age.

COMMON PROBLEMS THAT MAY AFFECT NUTRITION

Many problems faced by LBW or preterm infants are due to underdeveloped organ systems.

Poor suck due to an underdeveloped muscular and neurological system may cause poor intake requiring tube feeding. Sucking matures between 30 to 34 weeks gestation.

Immature gastrointestinal tract does not absorb and digest nutrients as efficiently, often leading to nutrient deficiencies as well as a caloric deficiency.

Gastroesophageal reflux due to incomplete control of the lower esophageal sphincter.

Small stomach may require more frequent feedings of a small volume.

Inability to self-regulate feeding because infants often cannot indicate when they are hungry. Can lead to inadequate feeding.

Higher nutrient needs as a result of inadequate nutrient stores and an immature digestive system.

Developmental delay may lead to poor feeding skills, difficulty eating, and delay of introduction of solid foods.

Ineffective breathing due to underdeveloped lungs may cause fatigue leading to poor dietary intake.

Ineffective thermoregulation may increase caloric need.

Infections may increase caloric need and result in diarrhea. Because of a high risk of infection, sanitation is extremely important for these infants.

NEC may necessitate a protein hydrolysate formula such as Pregestimil®, or in more severe cases, an elemental formula such as Tolerex®.

BPD can lead to slow weight gain and fluid restriction.

Impaired liver function can lead to a build-up of bilirubin and other waste products causing the infant to be jaundiced.

Psychiatric and social problems are most common with VLBW infants. These infants often are too fragile to be held and this interrupts the bonding process. Sometimes these infants refuse to eat, resulting in tube-feeding.

Knowledge deficit of parents/caregiver may lead to poor feeding practices including early feeding of solids. Parents may have unrealistic expectations for growth and feeding. FTT is common.

FEEDING CONSIDERATIONS

■ The feeding recommendations given by the physician should always be followed. Parents should not receive conflicting advice from WIC. If you have questions about a recommendation, call and discuss your concerns with the doctor or his staff.

■ Because parents of high-risk infants have so much on their minds, your recommendations for feeding may be misunderstood. It is extremely important to evaluate parents' understanding of what you have told them before they leave your office. There are several ways this can be done: have parents demonstrate what you have discussed; ask them to repeat the information you have told them; or ask them what advice they would give a friend in a similar situation.

■ Don't rush feeding progression. Solids generally are not introduced to a preterm infant until he weighs about 13 to 15 pounds, at about 6 months *corrected* age. Introduction of water and juice should also be delayed.

■ These infants usually take longer to eat a smaller amount of volume than normal infants, due to their weakness and the energy it takes to suck. They will also eat more often, every 1½ to 3 hours. Formula-fed infants will have a longer gastric emptying time and will need to eat closer to every 3 hours.

■ Swaddling provides control of the extremities and comfort, allowing the infant to concentrate on eating. If infants are neurologically immature they have trouble doing more than one thing at a time, e.g., eating and controlling extremities. This preservation of energy also can facilitate the feeding by giving the infant more energy to suck.

■ Breastmilk is ideal for these infants because it is easiest to digest, protects against infection and helps the baby's gut mature faster. Breastmilk may need to be fortified with vitamin and mineral supplements or a commercially available breastmilk fortifier. The breastmilk of a mother with a preterm infant is different in composition than for a mother with a full term infant. It is more suitable for the preterm infant, as it is more concentrated in calories, fat, protein, calcium, sodium, and selected anti-infective properties.

■ A mother can breastfeed even if her baby is tube fed. Her pumped milk can be given to the baby through the tube. To pump her milk, an electric pump is probably best because they obtain the best volume and fat content. Moms should be cautioned not to use the bike-horn pump because they cannot be kept sterile enough for the needs of the infant. In addition, this kind of pump can lead to a diminished milk supply and poor let-down. The hospital should have specific guidelines for collecting and storing breastmilk.

■ Non-nutritive sucking (on the breast or a pacifier), during tube feeding has been shown to accelerate development of an effective suck, speed gastric emptying and shorten transition to nipple feeding.

■ Special and exception formulas are common for this group of infants. There are several formulas designed specifically for the premature infant.

■ These infants often need vitamin and mineral supplements for proper growth. This need, which is specific for each infant, should be addressed by a physician.

■ Be sure these infants are weighed and measured accurately. Due to their small size, weight fluctuations can be a critical indicator of a problem. Always weigh the infant without clothing or diapers.

References

American Academy of Pediatrics: *Pediatric Nutrition Handbook*, 2nd ed. Elk Grove Village, Illinois, AAP, 1985.

Behrman, R.E. (ed.): *Textbook of Pediatrics,* 14th ed. Philadelphia, W. B. Saunders, 1992.

Eisenberg, A., Murkoff, H., and Hathaway, S.: *What to Expect the First Year.* New York, Workman Publishing, 1989.

Mohrbacher, N., and Stock, J.: *The Breastfeeding Answer Book*. Franklin Park, Illinois, La Leche League International, 1991.

O'Leary, M.: "Bringing a Premie Home: What Parents Want to Know About Feeding." March of Dimes Conference, 05 March 1987.

Riordan, J., and Auerback, K.G. (eds.): *Breastfeeding and Human Lactation*. Boston, Jones and Bartlett, 1993.

Whaley, L., and Wong, D. (eds.): *Nursing Care of Infants and Children,* 4th ed. St. Louis, Mosby Year Book, 1991.

Zeigler, E.E.: "Nutritional Management of Preterm Infants." Intensive Course in Pediatric Nutrition. Iowa City, 02 June 1992.